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CONSERVATIVE TREATMENT OF JOINT DISEASES.

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Though the title of my paper is comprehensive enough to include all joint diseases, yet I prefer to limit myself more especially to chronic joint diseases; of these, a large per cent. as found in children are recognized as tubercular in origin. In fact, this is so markedly true that some surgeons question whether chronic joint diseases in children are ever other than tubercular in character. Suffice to say, that the treatment of tubercular joints forms a considerable part of the work of the orthopædic surgeon. The treatment of chronic joint diseases has passed through much contention and many phases, but at last certain principles of conduct have come to be recognized, and it is only in the method of carrying them out that surgeons so widely differ. The great desideratum in the treatment of these joints is complete rest. The day of ankyphobia has come and gone, and there remains as one of the great factors in the successful treatment of these conditions the carrying out of this principle. But if the family physician thinks that by saying to the mother, "Put that child to bed and keep him there," that he is carrying out a great principle he will find himself mistaken; experience will soon teach him the error of his ways. The carrying out of this conservative principle in the treatment of joints requires arduous work, much perseverance, great patience, and a careful and minute attention to details. Only in the special hospitals for cripples found in our large eastern cities are the full benefits of conservative treatment seen.

It goes without saying that the better the health of the patient the more ready will be recovery from the joint disease. Therefore, measures looking to the sustaining and improving of his general health are eminently in order. Good food, fresh air and exercise in so far as it does not interfere with the immobilization of the inflamed joint, are of great benefit to the patient. Among the medicinal agents found useful are the tonics, cod liver oil, iron, arsenic, strychnia, and phosphorus. Baths and massage may be added to the general medical agents.

The treatment directed to the joint itself may be classified under the following headings: (1) Local application. (2) Injections. (3) Compressions. (4) Protection. (5) Fixation. (6) Traction.

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Among the local applications employed may be mentioned ointments, iodine, blisters, cautery, electricity, poultices, and hot fomentations. The aim of these applications is to modify the circulation by relieving the congestion. At times these applications are more or less effective as temporary measures to relieve pain. I have seen old knee cases of one, two or three years' standing at the time of an exacerbation, when the joint was hot, red and painful, be almost entirely relieved after several hours application of a poultice or hot fomentation. This measure is severely condemned by certain authors on the ground that it favors suppuration. Often the ice-bag is useful.

Many of these joints being subject to a tubercular synovitis, has suggested the idea of injecting some fluid into the joint which would destroy the tubercles or fungous growths. A solution of carbolic acid in strength 5 to 30 per cent. has been employed for this purpose, the injections being repeated for over fifty times. Tincture of iodine has also been employed. Good results have been reported by some, but on the other hand such poor or negative results have been reported by others that the method has not obtained much of a foothold.

Compression in the shape of rubber bandages is used with benefit in certain selected cases. It facilitates the absorption of fluid in oedematous tissue.

Protection, fixation and traction, which have for their aim rest to the joint, are, therefore, the important measures to be used in the treatment.

Protection from jar to a point in the lower extremity can be accomplished in the simplest manner by the use of crutches and a built-up shoe on the other foot. Unfortunately, children will not ordinarily use crutches, but throw them to one side, and hobble around on the limb. Therefore, braces which prevent the possibility of this jar become necessary. In the upper extremities fixation becomes at the same time protection.

Fixation, *i. e.*, prevention of all flexion, extension, rotation, etc., is indicated in all acute joint inflammations, and by many authors fixation is declared the best in all inflammations—acute, sub-acute, and chronic. Others hold that in the more chronic cases a limited amount of careful motion is not injurious, but rather helpful. I feel disposed to put myself in the class who feel that the least motion possible is the best. This fixation can be accomplished by wooden or leather splints, plaster or silicate bandages, etc. My preference is plaster-of-paris.

Traction, besides aiding in the fixation, also gradually overcomes the crowding together of the joint surfaces due to the spasm of the

muscles surrounding the joint. This traction in the lower extremities can be accomplished by means of the stirrup weight and pulley, or by means of an extension brace. Too long confinement in bed should be avoided, though, as tending to undermine the general health.

To avoid this confinement, and yet have traction in a supine position, use by many is made of a portable frame or "stretcher splint." The child, securely attached to this frame, may be carried about, may be taken into the open air and sunlight, and may even be taken out for a carriage ride. In the upper extremities weight of the limb is usually considered sufficient traction, provided the joint is properly protected and movement prevented.

The application of the above general principles in the treatment of specified joints requires modifications and changes, and attention to certain details which I will now attempt to indicate.

There is present in all joint diseases some reflex spasm of muscles surrounding the joint. In the shoulder, elbow, wrist and ankle this spasm of muscles is not great, and does not lead to great deformity or much pain. By the advice of many authors the joint is placed in the position of greatest ease during the early or acute stage, and later, when most of the spasm of muscles has disappeared, the joint is placed in that position which would be best if it became ankylosed. This rule may be carried out in exquisitely sensitive joints, effort not being made to rectify the position until part of the muscular spasm is gone. In disease of the shoulder the arm is held in nearly a vertical position, with the elbow close to the side; in disease of the elbow the fore-arm is held flexed to an angle of 120 degrees; when the wrist is implicated the hand is held slightly dropped; if it is the ankle that is diseased a position of slight equinus for the foot is best.

The hip and knee offer a great contrast to the above joints, in that they are subject to violent spasms of surrounding muscles, which often causes excessive pain and serious deformity.

During the first stage of knee joint or hip disease any method of mechanical treatment must have for an important feature the relief of intra-articular pressure. This may be accomplished by (1) fixation in some rigid apparatus which by preventing motion will cause the subsidence of muscular spasm; (2) extension by weight or brace.

Concerning certain principles which hold in the treatment of joint diseases, there are apparently wrong impressions held by many.

It is evidently believed by some that extension separates the joint surfaces. Recently an Ohio medical writer has been lauding the use of elastic extension, its benefit being derived from the supposition that it separates the joint surfaces. Bradford demonstrated several

years ago, upon the cadaver of a child, that 150 pounds acting at the hip joint caused no separation of the acetabulum and head of bone. The effect of extension is to steady the muscles and prevent spasm.

The fallacy held by some in regard to motion, *i. e.*, that a slight amount in certain stages is not detrimental, but rather beneficial, I have previously referred to.

In carrying out extension (*i. e.*, traction) by the usual method of weight and pulley, with child in bed, it must be remembered that to allow the child to sit up in bed and twist about is not fixation by any means.

The movement of the child's body through an arc, necessary for it to rise from a lying to a sitting posture, means a movement at the hip joint to any amount approaching 90 degrees.

Another important point is to make the extension in the line of deformity, otherwise the limb will act as a lever, the point of attachment of muscles the fulcrum, and intra-articular pressure will actually be increased. The adhesive strips should extend well up the thigh, so as not to bring too great a strain on the ligaments of the knee joint.

In England, the Thomas hip splint, devised by Dr. Thomas, of Liverpool, is used almost to the exclusion of other methods, and with reported excellent success. It was devised on the principle of complete fixation without making use of traction. It consists of a metal bar running posteriorly from the calf to upper part of back, opposite the axillary space. It is secured to the body by a chest band, pelvic band, thigh and calf bands. This brace has been used considerably in the United States during more recent years.

To prevent jar in walking the child uses crutches, the shoe on the well side being built up three or four inches, thus raising the foot of lame limb several inches from the floor. A splint which combined extension with fixation would theoretically be about perfect. Dr. Lovett, of Boston, with this idea in view, made a brace somewhat similar to the Thomas, but ran it below the foot and then applied extension. Very good results are obtained with this brace.

On account of the deleterious effects to the general health produced by a too long confinement in bed efforts have been made by various surgeons to devise a brace which permitted walking and yet at the same time prevented a jar and movement of the joint. To American surgeons is due the credit of developing the possibilities of this form of treatment. None of the walking braces in common use, all of which are modifications and improvements of the original Davis brace, afford complete fixation at the hip; and although I believe, as previously stated, that the slightest movement is not ben-

eficial, but rather the opposite, yet I believe that the benefits of exercise more than counterbalance the deleterious effects of the motion involved. So that after the acute stage is past the muscular spasms are gone, the child has brightened up, then I think it is in the line of advancement to put the child on its feet by means of a walking splint —some form of the Taylor or Sayre long splint.

So different are the results obtained in the treatment of hip disease, and so widely at variance are opinions of surgeons as to the advisability of certain measures, that one is often at a loss to account for this state of things. As an example, some surgeons state that they have never seen a case where excision seemed indicated, while others equally conversant with the disease think that many of the cases should be excised early.

Much of this difference is due to the social status of the patient. In the higher walks of life every suggestion can be carried out, the child is carefully nursed and fed and the joint is guarded against every form of injury.

Among the poor we have to contend against ignorance, inattention, unhealthy surroundings and improper feeding. With the latter class the method of extension in bed cannot be thought of after the acute symptoms have subsided.

In these cases there can be no question but that the use of the walking splint with built-up shoe is the best for them. It is needless to say that it is among the children of the poor that we see the cases which go on to complete destruction of the joint, while among the better classes the disease is often checked in its earlier stage.

#### COMPLICATIONS.

There are several complications occurring in the treatment of hip disease that require consideration, viz.: (1) Abscesses; (2) dislocation; (3) deformities: (a) flexion; (b) adduction; (c) abduction; and (4) amyloid degeneration of viscera.

#### ABSCESSES.

Surgeons though all agreeing on the treatment of acute abscesses have heretofore differed widely concerning the treatment of chronic abscesses accompanying joint diseases.

At the annual meeting of the American Orthopaedic Association, which met in Washington in September, 1891, the subject of abscesses in bone diseases, especially in Pott's disease, was pretty thoroughly discussed. Dr. Shaffer, of New York, expressed himself thus: "The extremists who would open every tubercular abscess connected with an actively diseased spine or joint are I think, as much in error as those who ignore the indications which point to surgical interference. . . . My own results, after I adopted the plan of opening every chronic abscess, were not so satisfactory as were those which followed non-interference." In the general discussion of abscess in Pott's disease, Dr. Hoffa, of Wurzburg, Germany, said that "German surgeons had come to the conclusion that it is only wise to open large abscesses when they cause much pain, or give rise to high temperature, or when they are pointing, or when it seems certain that primary bone disease is cured." Mr. Howard Marsh, F. R. C. S., of England, reported that among English surgeons "the feeling was gaining ground that these abscesses (in Pott's disease) should be opened." They are foci for general infection, although he was free to admit that he did not believe that this occurred as frequently as many would have us

believe. Nicholas Senn believes in first removing the contents of the chronic abscesses by aspiration, then to thoroughly wash out the cavity with a 3 to 5 per cent. solution of boracic acid until the fluid returns clear, and finally to inject from a drachm to an ounce (depending on size of cavity, etc.) of a 10 per cent. solution of iodoform in glycerine into the cavity.

The writer has often made use of aspiration and iodoformization in these chronic abscesses, with frequently happy results. The method, as outlined by Senn, is one that I think should be given a thorough trial before proceeding to more radical measures.

#### DISLOCATIONS.

True dislocation occurs in comparatively few cases of hip disease. From the disintegration of the head of the bone and the upper edge of the acetabulum, due to disease and to the pressure from spasm of the muscles, the leg is usually shortened a certain amount, and frequently partial dislocation seems to have taken place. Where true dislocation has taken place, the only thing left to be done is to anæsthetize the patient and attempt a reduction.

#### DEFORMITIES.

The thigh, held in position of deformity, is a condition frequently found in this disease. The deformed positions are flexion, adduction and abduction. Flexion can often be overcome by continued extension in bed. By mere fixation during the acute stage, the irritation of the muscles is overcome, spasm subsides, and the limb is easily brought to a correct position. In the latter stages, when there is more or less fibrous union, the use of an anæsthetic is required, and by means of brisement force, with or without myotomy, tenotomy, fasciotomy, etc., the deformity may be overcome. When there is bony union an osteotomy is required. For these cases the operation known as Gant's femoral osteotomy—the fracture of the femur below the trochanter minor—is best.

Adduction in these cases should be entirely overcome, if possible, as this deformity, by increasing the apparent shortening, increases limping very much. Abduction, on the other hand, moderate in amount, need not worry the attendant, for by increasing the apparent length of the limb it lessens the limping, and is, therefore, rather of an advantage.

#### VISCERAL CHANGES.

Amyloid degeneration of viscera, the result of a suppurating joint, calls for active interference on the part of the surgeon. Nothing short of stopping the suppuration will bring about recovery. Scraping out the joint, resection or amputation may, therefore, be required to save the life of the patient.

#### KNEE JOINT.

In the treatment of tubercular synovitis or ostitis of the knee joint, many of the principles enumerated in the treatment of hip disease hold equally well. There is the general health, counter-irritation, protection, fixation, abscesses and amyloid degeneration, the consideration of which has been given under the former head.

Extension, or more properly speaking, traction, does not play such an important part in the treatment of this joint as in that of the hip. Many surgeons do not use traction at all. Recently I noticed that they were using it in a few cases at the Hospital for Ruptured and Crippled, New York City, while during my service at that institution, traction was not used in disease of the knee joint except in rare instances.

Fixation by means of plaster-of-paris, and the use of the Thomas

knee-brace, furnish the most efficient means of treating this disease.

Deformity in the shape of flexion is a very frequent accompaniment of this disease, and cannot usually be overcome by traction. The Bilroth splint, incorporated in plaster-of-paris, furnishes a simple and very effective means of correcting this deformity.

In tuberculosis of the ankle joint, after the acute stage, or immediately, if not too painful, the foot should be brought to a right angle with the leg and fixed with a splint or plaster-of-paris; then, with the use of a Thomas splint, the child can walk, and may be allowed to get out in the open air.

#### EXCISION.

Probably there is no question in surgery concerning which surgeons differ more widely than they do on the question of excision of joints. Some surgeons of large experience claim that they have never seen a case so desperate that, in their judgment, excision was required, while others advocate excision as soon as an abscess is formed.

Howard Marsh, F.R.C.S., in his general remarks on excision, expresses himself thus: "The choice is no longer as it was in Fergusson's day, between excision and amputation, between the loss of a joint only and the loss of a limb; it is between excision and the cure of the disease by rest early applied and sufficiently long continued." And further on, after describing the great improvement made in the operation during the last few years and the lowered mortality, he continues: "The defects of excision, however, lie chiefly in the ultimate condition of the limb. The limb, especially when the operation is performed on children under nine and ten (and inflammatory disease is much more prevalent before than after this age), is often very unsatisfactory. It remains short and weak, and becomes in many instances seriously distorted." And again he says: "These views, which have made me, in company with the majority of English Surgeons, rather turn away from excision than regard the operation as a common recourse in the treatment of scrofulous joints, have reference principally to the hip and knee—the instances in which it is most important to come to a direct judgment respecting this proceeding."

Charles T. Poor, of New York, in writing of excision in hip disease, says: "The result of excision of the hip joint renders the patient more or less a cripple for life. The cases that recover with slight shortening are too few to hold out any expectation that they will ever form the rule. So far as the limb is concerned, the best result after an excision will not compare in usefulness to a limb ankylosed at a favorable angle. The question of excision, then, rests upon other grounds than comparative usefulness. We must admit that, notwithstanding the success of the operation, the patient has suffered a serious mutilation. Excision should therefore be reserved for those cases in which no means less severe will accomplish the purpose. . . .

"In considering the necessity for excision, the causes of a fatal termination must be taken into account. These are exhaustion, tuberculosis and amyloid degeneration; and really the question turns upon preventing these diseases."

The above is about the rule of practice at the Hospital for Ruptured and Crippled, an institution that treats about 9000 patients a year. That is, excisions are done where the life of the patient is threatened by the disease.

The views of operating surgeons differ considerably on this sub-

ject. Wright considers that in hospital cases nothing short of excision can prevent the ultimate progression of the disease and final exhaustion from pain and the discharge.

Clowell views in this wise: "That in hospital cases it should be performed as soon as there is distinct grating in the joint, accompanied by pains, profuse suppuration or failure of health."

Bryant would have us operate as soon as dead bone can be made out.

McNamara takes a moderately conservative view, not operating until conservative measures have failed.

Mr. Holmes is not an advocate of excision, except in desperate cases.

Dr. C. F. Taylor has never met a case of hip disease which seemed to require excision. But it must be remembered that Dr. Taylor's conclusions are drawn from cases seen in the higher walks of life.

Bradford and Lovett, in their work on "Orthopaedic Surgery," have gone very thoroughly into the subject of excision in hip disease. They call attention to the increased general tuberculosis following incision. From the above work are the following remarks: "Mr. Barker, a warm advocate of excision, in his lecture at the Royal College of Surgeons, in 1888, on the treatment of tuberculous joint disease, said that in no less than 10 per cent. of all deaths following excision rapid miliary tuberculosis supervened in such a way as to suggest strongly, if not to prove, that surgical interference was the cause of the generalization of the disease." In 837 resections reported by Wartman, the same mortality (10 per cent.) from general tuberculosis is noted. "Besides the cases which are fatal and those to be classed as recoveries, there is this long series of cases in which the wounds do not heal nor does the leg become useful. Leisink classed 12.5 per cent. of his cases as 'unhealed,' and Holmes speaks of 26.5 per cent. as failures. In the matter of relapse, Yale would set the percentage at not less than 20, from his personal experience, and he quotes Neuber as saying that about half of his cases have relapsed. Nearly all of these limbs are useless as regards their function."

A committee of the Clinical Society of London, appointed in 1880 to investigate the subject of resection in hip disease, made the following report: "With respect to the general question of operative interference, the committee are of the opinion that the effect of complete rest and weight or other modes of extension and the withdrawal of matter should always be patiently tried in the first instance, and that operative interference should be resorted to only when these means have failed to secure the favorable progress of the disease."

After quoting largely from various statistics, Bradford and Lovett draw the following conclusions: "It must be evident in comparing the results of excision of the hip with the mortality and results of conservative treatment, that excision has no place in the routine treatment of the disease, because its mortality is higher and its functional results inferior. The operation has, however, a decided usefulness in late cases of hip disease when it becomes distinctly a life-saving procedure, and in severe cases at an early stage when no home treatment or adequate hospital treatment for a long time is practicable."